


REEI Sharing on MSW and Climate Change

全球气候政策演进：碳中和战略如何影响发展范式的转变

Global Climate Policy: Carbon Neutrality and Development

磐之石 ROCK ENVIRONMENT AND ENERGY INSTITUTE
环境与能源研究中心

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‘The world listened, but it didn’t hear. The world listened, but it didn’t act strongly enough … Nobody is safe. And it is getting worse faster.’

By Inger Andersen

Executive Director of UNEP

At the press conference to launch the Summary for Policymakers of the Working Group I of IPCC 6th Assessment Report on 09th Aug, 2021

2020年9月：

我国首次提出了长期气候政策目标

碳中和/净零排放目标全球进展 *（截止到2020年12月底）*

进展情况	国家和地区（承诺年）
已实现	苏里南共和国、不丹
已立法	瑞典（2045）、英国（2050）、法国（2050）、丹麦（2050）、加拿大（2050）、新西兰（2050）、匈牙利（2050）
立法中	欧盟（2050）、西班牙（2050）、智利（2050）、斐济（2050）
政策宣示	芬兰（2035）、奥地利（2040）、冰岛（2040）、德国（2050）、瑞士（2050）、挪威（2050）、爱尔兰（2050）、葡萄牙（2050）、哥斯达黎加（2050）、斯洛文尼亚（2050）、马绍尔群岛（2050）、南非（2050）。 **东亚三个主要经济体在2020年9-10月宣布碳中和目标：** 中国（2060）、日本（2050）、韩国（2050）

已立法7个

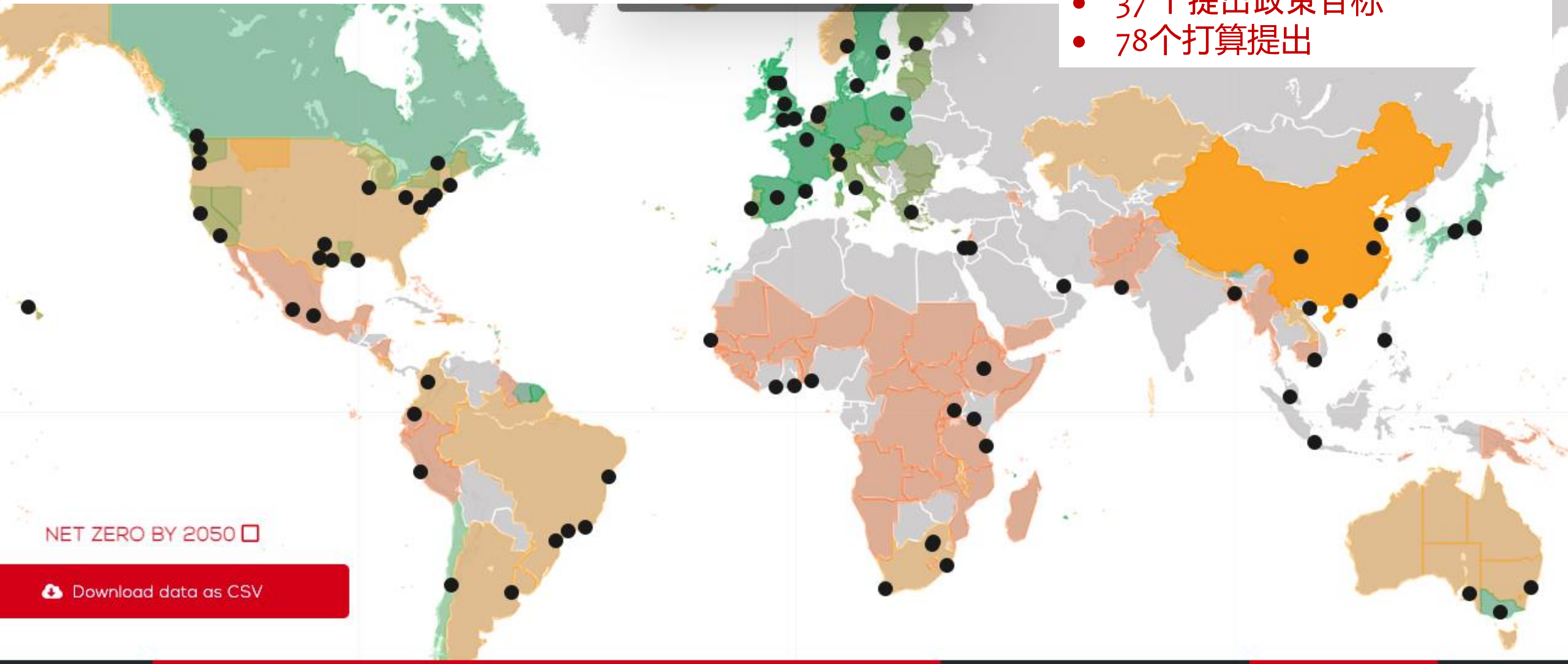
立法中4个

政策宣示15个

风能专委会CWEA

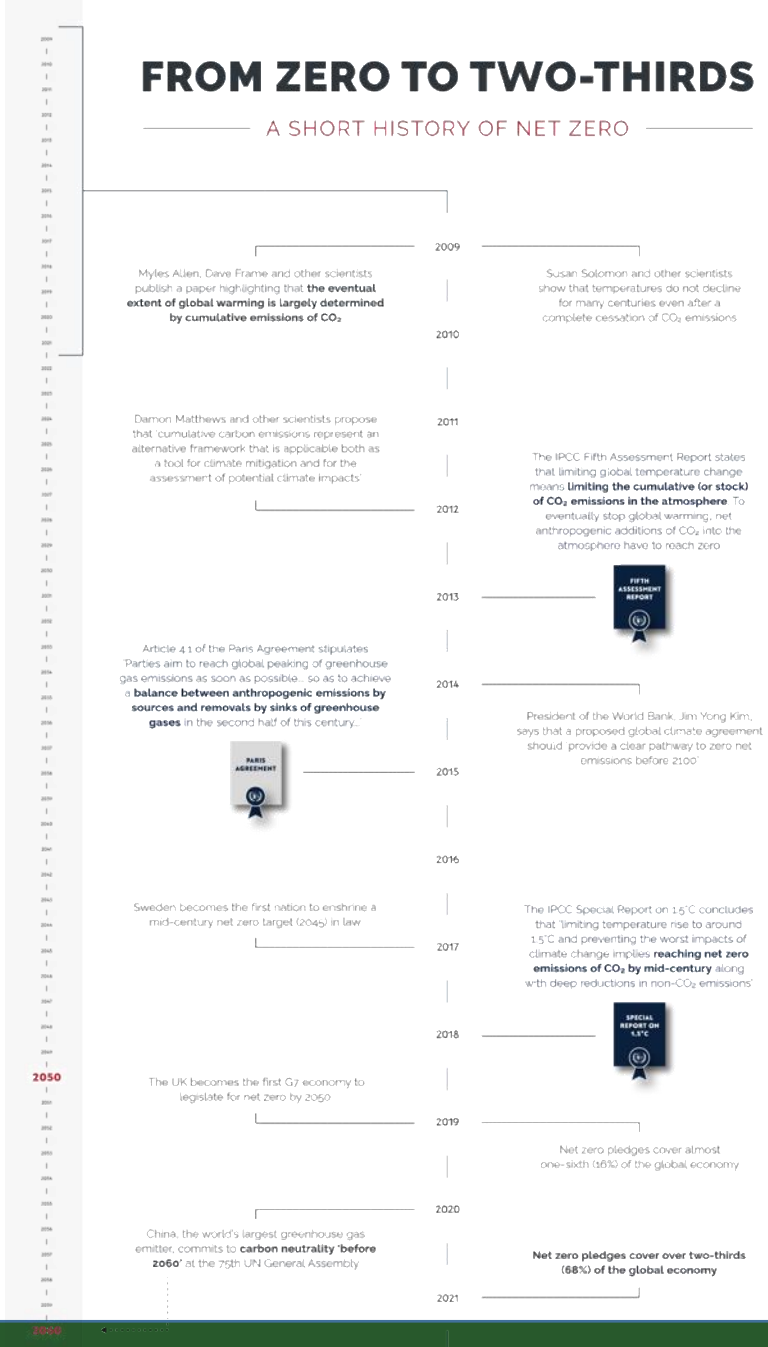
碳中和目标全球最新进展 *(截止到2021年7月底)*

- 两个已经达到（苏里南和不丹）
- 12个国家已经立法（2050）
- 4个国家立法中
- 37 个提出政策目标
- 78个打算提出



为什么要提出碳中和目标？背后推动力？对未来发展的影响？

- 2013年：IPCC第五次评估报告(5th AR)提出温升控制需要全球净零排放
- 2015年：巴黎协定
- 2017年：瑞典成为第一个立法本世纪中叶净零排放的国家（2045）
- 2018年：IPCC 1.5度特别报告表明本世纪中叶需要全球净零排放
- 2019年：英国、欧盟等相继提出并立法2050净零排放目标
- 2020年：中日韩等国陆续提出
- 2021年：IPCC AR6；COP26 ……



ECIU

SIXTH ASSESSMENT REPORT
Working Group I – The Physical Science Basis

ipcc
INTERGOVERNMENTAL PANEL ON climate change

Regional fact sheet - Europe 欧洲

Common regional changes

- Regardless of future levels of global warming, temperatures will rise in all European areas at a rate exceeding global mean temperature changes, similar to past observations (*high confidence*).
- The frequency and intensity of hot extremes, including marine heatwaves, have increased in recent decades and are projected to keep increasing regardless of the greenhouse gas emissions scenario. Critical thresholds relevant for ecosystems and humans are projected to be exceeded for global warming of 2°C and higher (*high confidence*).
- The frequency of cold spells and frost days will decrease under all the greenhouse gas emissions scenarios in this report and all time horizons, similar to past observations. (*high confidence*)
- Despite strong internal variability, observed trends in European mean and extreme temperatures cannot be explained without accounting for anthropogenic factors. Before the 1980s, warming by greenhouse gases was partly offset by anthropogenic aerosol emissions. Reduced aerosol influence in the recent decades has led to an observable positive trend in shortwave radiation. (*high confidence*)
- Observations have a seasonal and regional pattern consistent with projected increase of precipitation in winter in Northern Europe. A precipitation decrease is projected in summer in the Mediterranean extending to northward regions. Extreme precipitation and pluvial flooding are projected to increase at global warming levels exceeding 1.5°C in all regions except the Mediterranean. (*high confidence*)
- Regardless of level of global warming, relative sea level will rise in all European areas except the Baltic Sea, at a rate close to or exceeding global mean sea level. Changes are projected to continue beyond 2100. Extreme sea level events will become more frequent and more intense, leading to more coastal flooding. Shorelines along sandy coasts will retreat throughout the 21st century (*high confidence*).
- Strong declines in glaciers, permafrost, snow cover extent, and snow seasonal duration at high latitudes/altitudes are observed and will continue in a warming world (*high confidence*).
- Multiple climatic impact-drivers have already changed concurrently over recent decades. The number of climatic impact-driver changes is expected to increase with increasing global warming (*high confidence*).

Projected changes in seasonal (Dec–Feb, DJF, and

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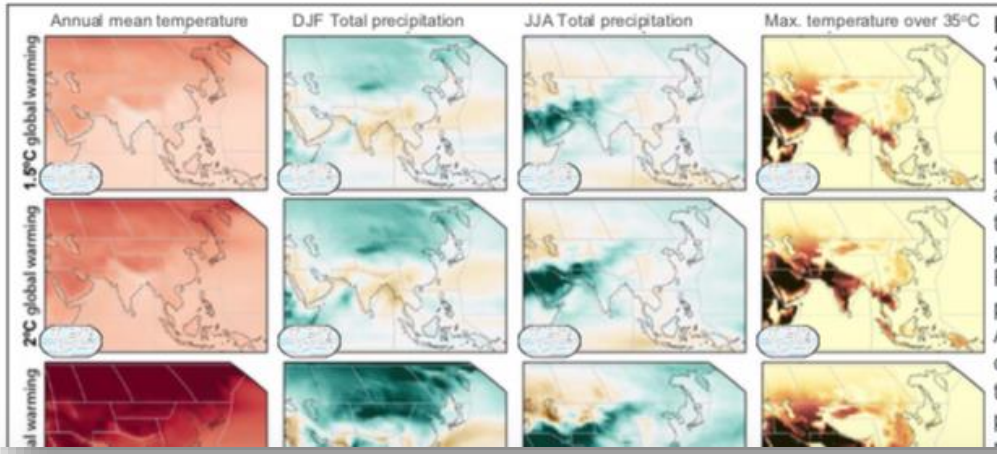
ipcc
INTERGOVERNMENTAL PANEL ON climate change

Regional fact sheet - Asia 亚洲

Common regional changes

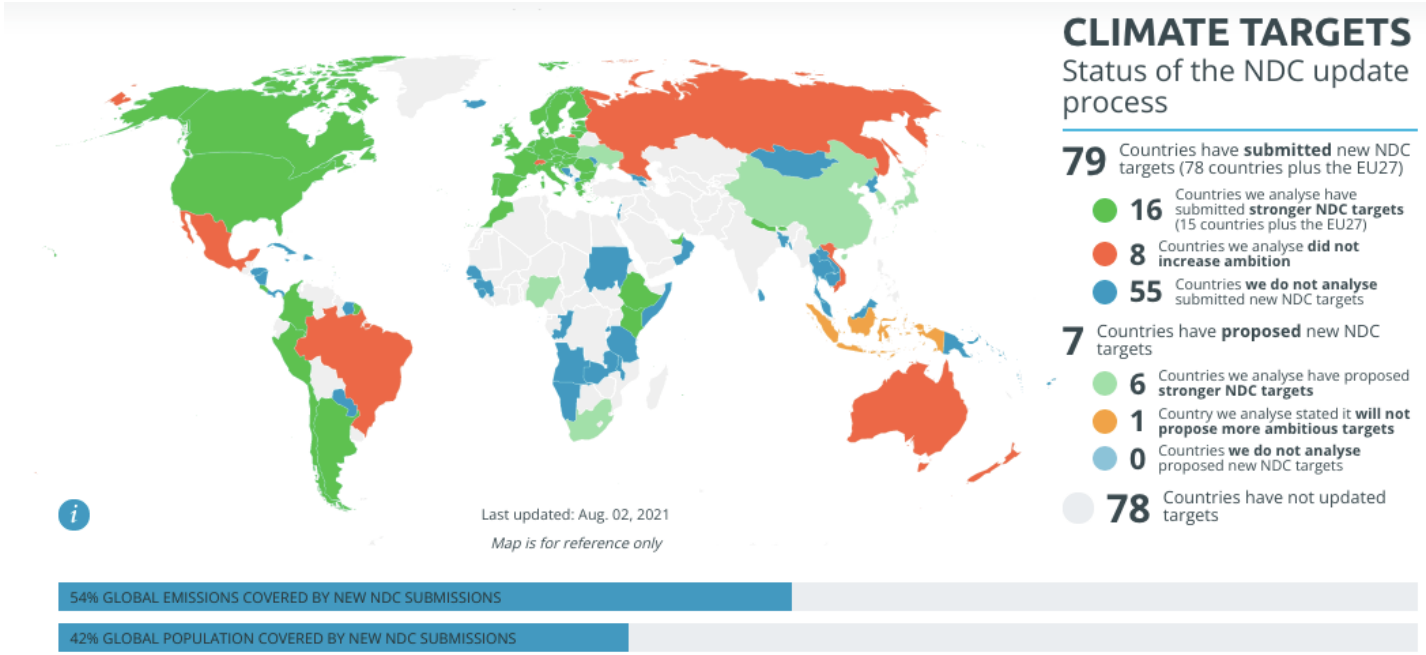
- The observed mean surface temperature increase has clearly emerged out of the range of internal variability compared to 1850-1900. Heat extremes have increased while cold extremes have decreased, and these trends will continue over the coming decades (*high confidence*).
- Marine heatwaves will continue to increase (*high confidence*).
- Fire weather seasons will lengthen and intensify, particularly in North Asia regions (*medium confidence*).
- Average and heavy precipitation will increase over much of Asia (*high to medium confidence*).
- Mean surface wind speeds have decreased (*high confidence*) and will continue to decrease in central and northern parts of Asia (*medium confidence*).
- Glaciers are declining and permafrost is thawing. Seasonal snow duration, glacial mass, and permafrost area will decline further by the mid-21st century (*high confidence*).
- Glacier runoff in the Asian high mountains will increase up to mid-21st century (*medium confidence*), and subsequently runoff may decrease due to the loss of glacier storage.
- Relative sea level around Asia has increased faster than global average, with coastal area loss and shoreline retreat. Regional-mean sea level will continue to rise (*high confidence*).



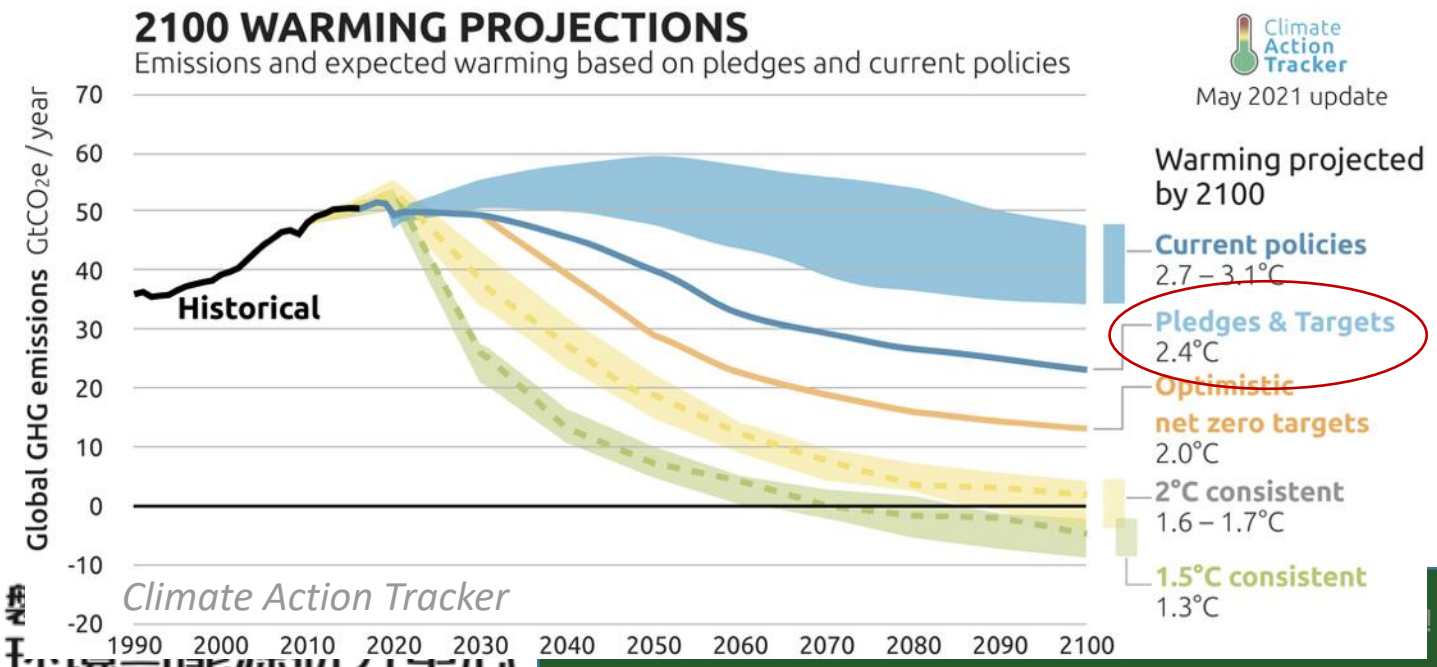
Projections at 1.5°C, 2°C, and 4°C global warming

Changes relative to the 1850–1900 in annual mean surface temperature, total precipitation (Dec–Feb, DJF), and total precipitation (Jun–Aug, JJA). Last column shows the total number of days per year with maximum temperature

IPCC最新发布的第六次评估报告表明，欧洲与亚洲的区域气候变化相比，所有影响都是高概率事件（温升、强降水、冰川融化、海平面上升），还多了一个多气候影响因素。



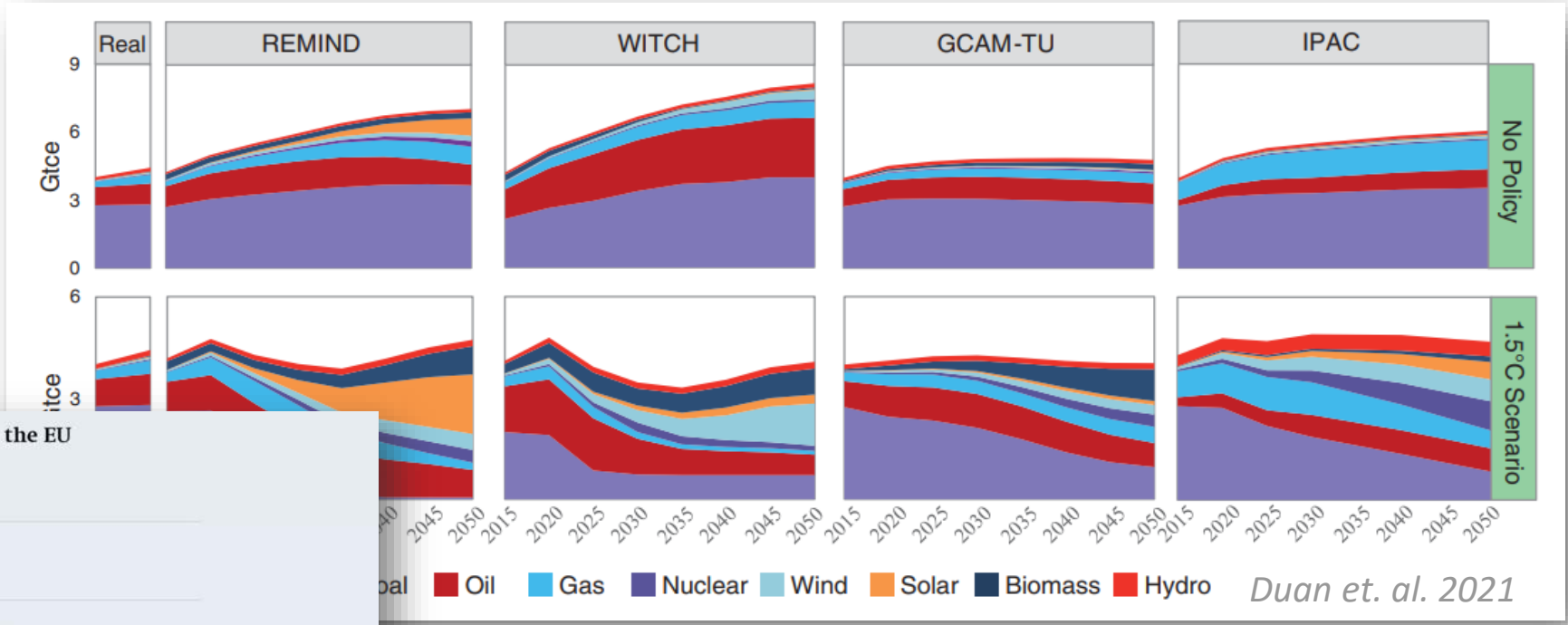
目前承诺水平仅仅奠定了基础



深度、快速脱碳才能满足温升控制目标

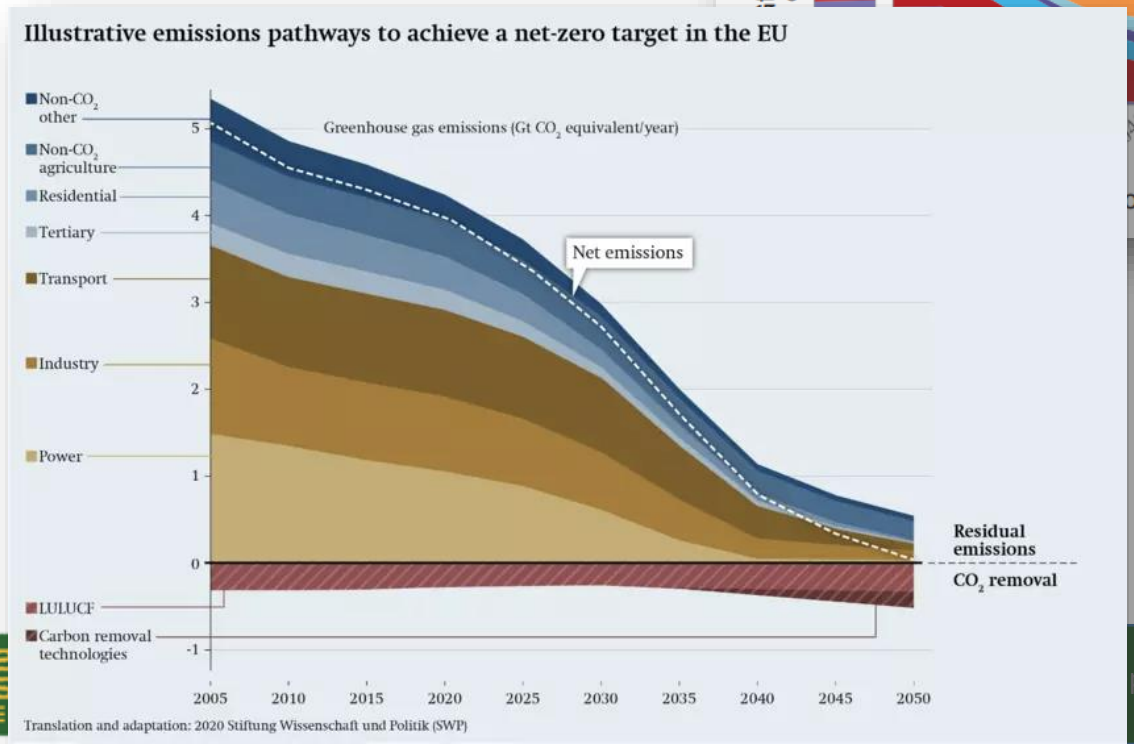
碳中和目标的实现路径

- 中国



Duan et. al. 2021

- 欧盟



碳中和对未来发展的影响

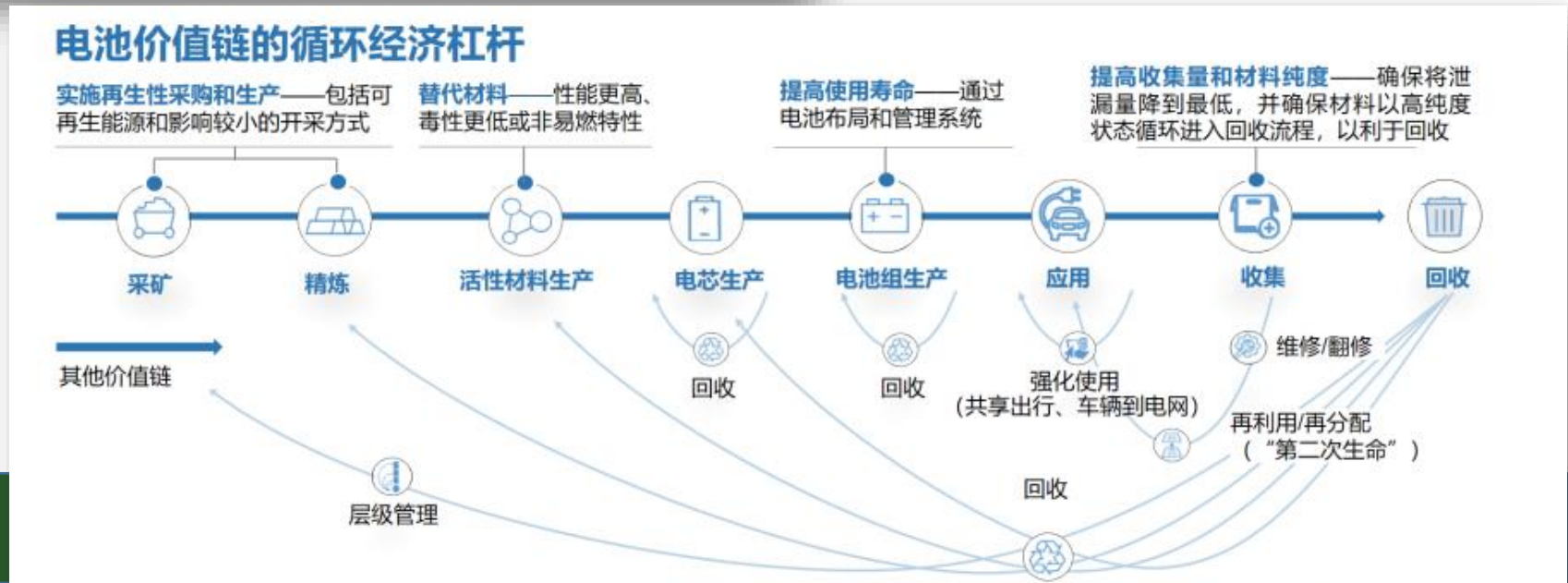
- 地区、城市层面
- 不同部门、产业
- 企业层面
- 个人？

车企的“退燃”目标

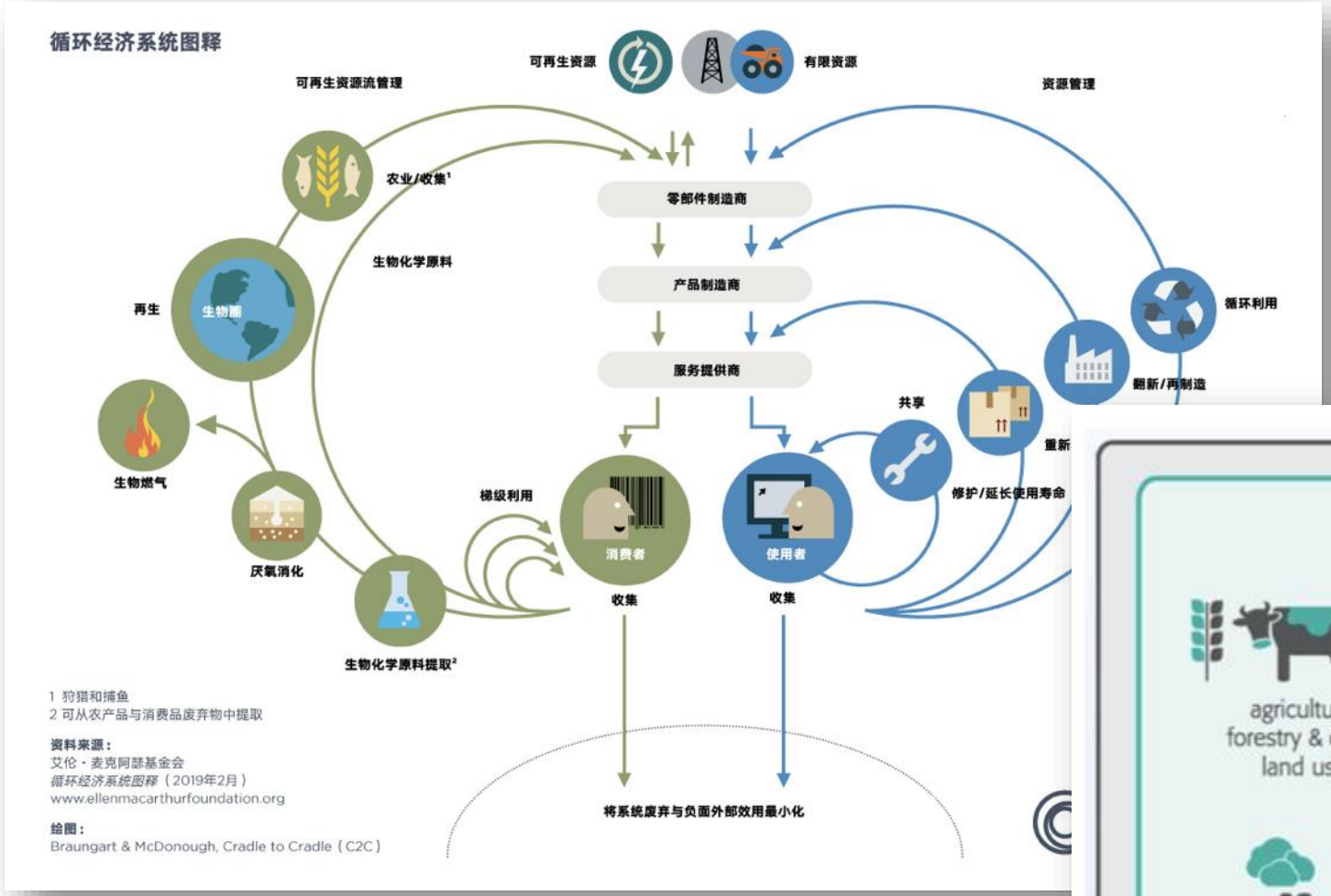
Manufacturer	Announcements	Type of vehicles	Year
Volvo Cars	50% 100%	BEV BEV	2025 2030
Volkswagen group *Volkswagen* *Porsche* *Audi*	 *More than 70%* *100%* *100%*	 *BEV* *BEVBEV, PHEV,* *HEV* *BEV*	 *2030* *2035* *2030* *2033*
General Motors	100%	BEV	2035
Jaguar Land Rover *Jaguar*	100% *100%*	BEV, PHEV(unclear) *BEV, PHEV*	2030 *2025*
Ford	100% 100%	BEV, PHEV Only BEV	2026 2030
Stellantis	70%	BEV, PHEV	2030
BMW *Mini*	At least 50% *100%*	BEV *BEV*	2030 *2030*
Nissan	100%	BEV, PHEV, HEV	2030
Renault Group (Renault brand)	65% 90%	ZEV, PHEV, HEV ZEV, PHEV, HEV	2025 2030
Daimler	Up to 25%	BEV	2025
Honda	100%	BEV, PHEV, HEV	2040
	1 million BEV globally	BEV	2030

欧盟新版《循环经济行动计划》将电池和车辆当做实施循环经济的关键产业链之一。

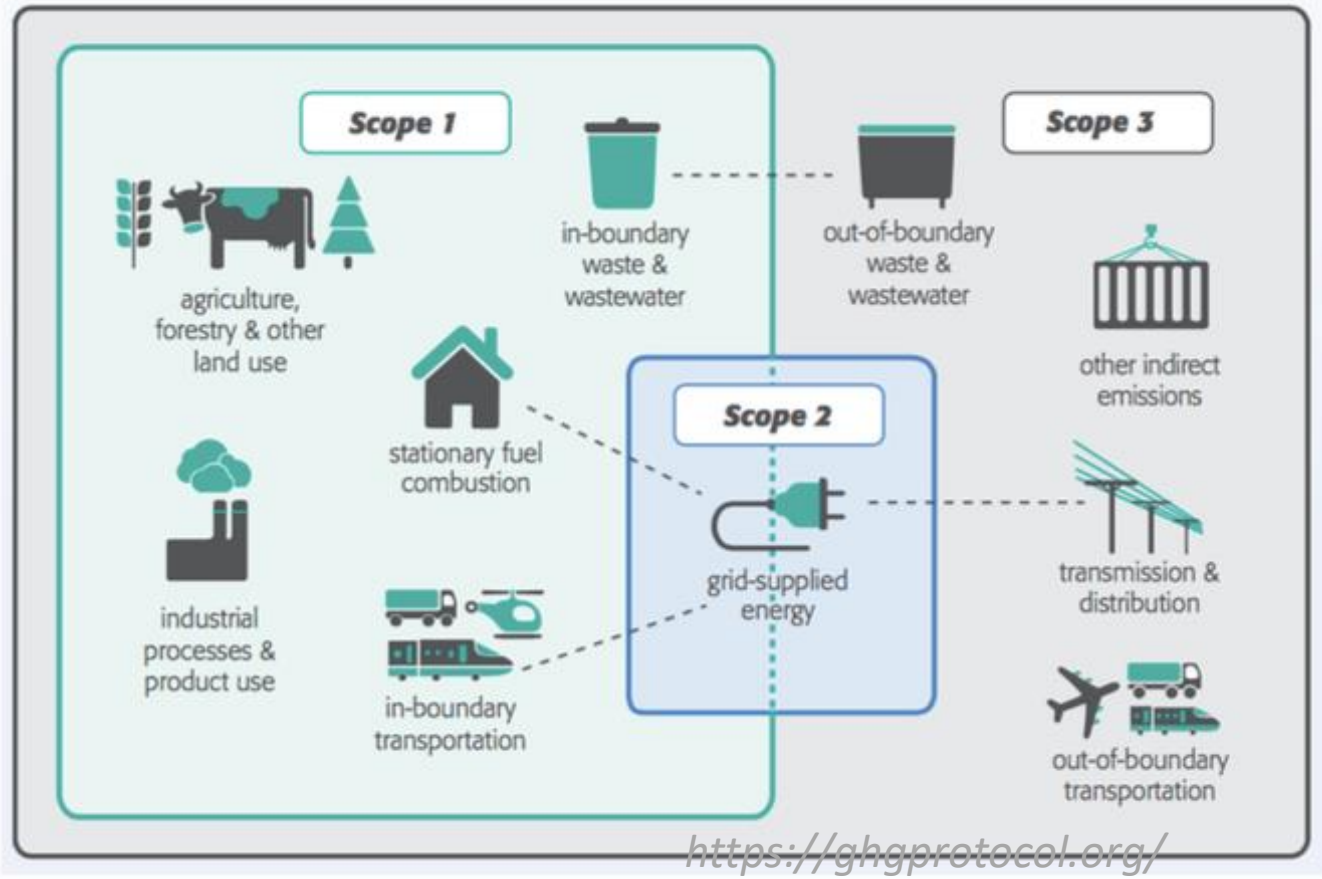
发展范式：线性经济向循环经济的转变亟需提速



循环经济 vs 气候变化

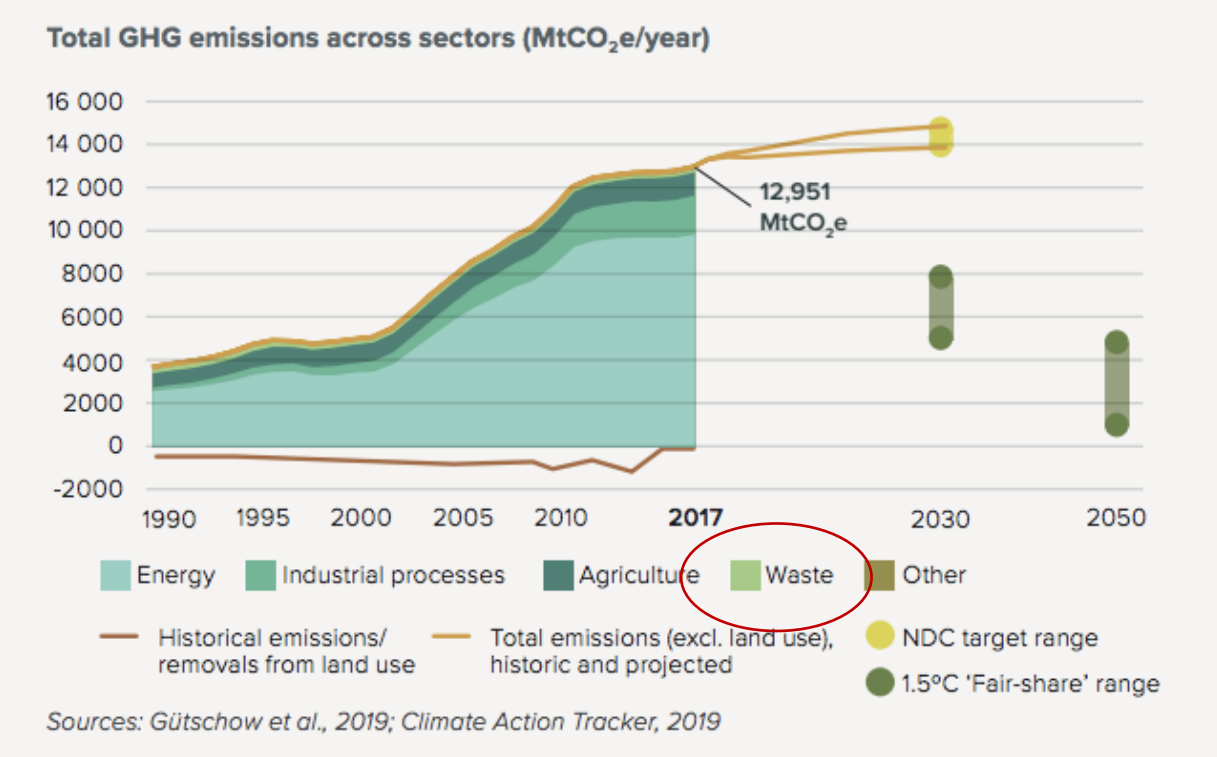


https://www.ellenmacarthurfoundation.org

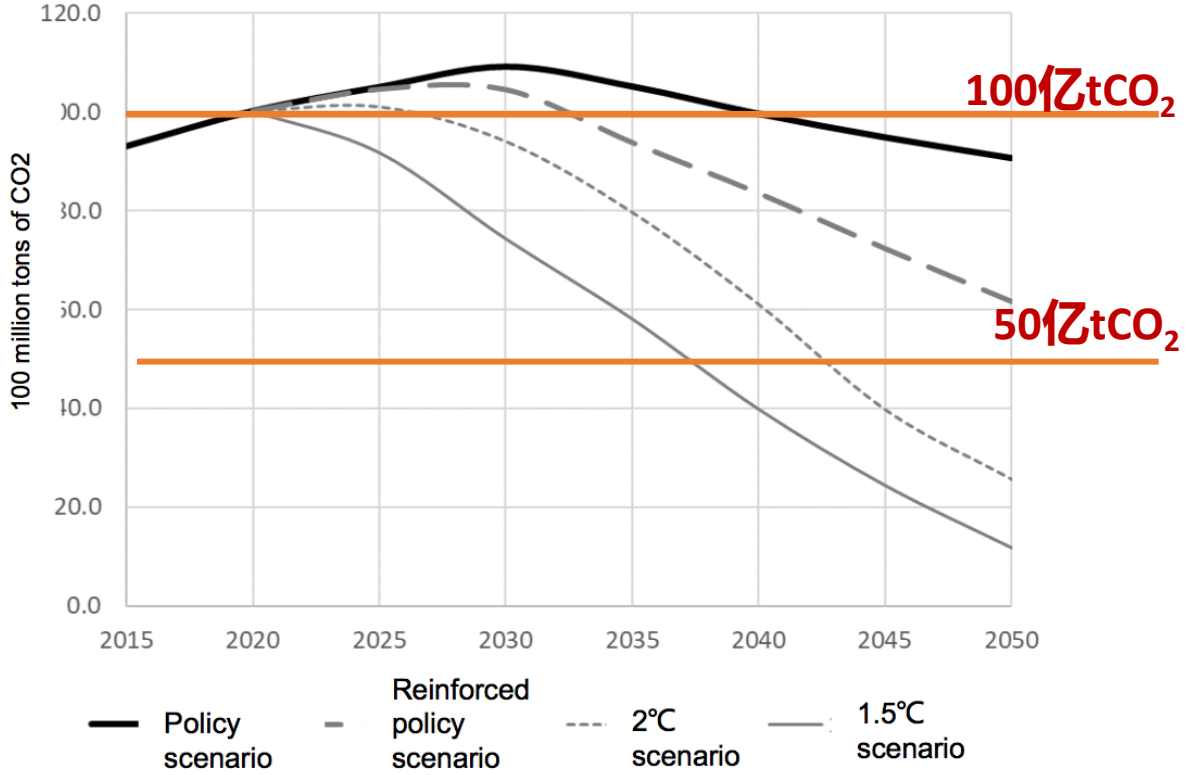


https://ghgprotocol.org/

废弃物温室气体排放控制



中国2050碳排放情景



Source: Institute of Climate Change and Sustainable Development, Tsinghua University

我国当前状况：

- 温室气体排放占比很小（1.7%）
- 容易被忽略（非二氧化碳，很分散）
- 路线比较明确，实施却很困难

废弃物与气候变化议题的发展趋势：

- 未来占比会越来越大
- 产品的生命周期碳排放核算是一个驱动力
- 循环经济对于气候的考量

谢谢！

Thank you for your attention!

磐之石环境与能源研究中心
ROCK ENVIRONMENT AND ENERGY INSTITUTE

致谢：感谢万科基金会对本活动的资助